Program: SPR-0010(36) FFY99	Part: II Research and Development

Project Title: Investigation of Bridge Approach Settlements **Project ID:** 0092-00-13
Administrative Contact: Nina McLawhorn   **Sponsor:**
WisDOT Technical Contact: Bob Arndorfer   **Approved Starting Date:** Apr 18, 2000
Approved by COR/Steering Committee: $99,979.00   **Approved Ending Date:** Apr 18, 2007
Project Investigator (agency & contact): Sam Helwany: UW-Milwaukee

Description: The study will be conducted over 7 years (84 months), and the five (5) tasks will be completed in two (2) phases.
Phase I: Synthesis of Previous and Current Work on Bridge Approach Settlement
Task 1: Literature Review and Personal Interviews
Task 2: "Best Practices" Summary Report
Task 3: Methods for Settlement Calculations
Phase II: Effectiveness of the Selected Mitigation Methods
Task 1: Instrumented Full-Scale Tests
Task 2: Interim and Final Reports

Background:
This study will be broken into two phases. Phase one will consist of personal interviews and a literature search of all existing work and research in this area. After this portion of the study is completed, a 'best practices' summary report will be submitted. This report will discuss which methods appear to be the most promising for solving the identified approach problems. Phase two will involve performing field pilot studies of a limited number (2-5) of the 'best practice' methods that show the most promise for WisDOT use. This will include construction of the bridge approaches as well as monitoring of them for a period of several years. Monitoring may include such items as pavement distress, maintenance history and vertical displacement. A cost comparison of the various methods will also be performed. Interim reports will be submitted yearly until the final report is written at the conclusion of the testing period.

Total Study Budget	Current FFY Budget	Expenditures for Current Quarter	Total Expenditures to Date	Percent Complete
$99,979.00	**$12,497.37**	$0.00	**$62,069.29**	**62 (%)**

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Progress This Quarter:
(Includes project committee mtgs, work plan status, contract status, significant progress, etc.)

Monitoring of the two bridges (Cranberry bridge and Hemlock) in District 4 continues. The last readings were taken in September 2003. Excellent inclinometer measurements were obtained in terms of consistency with previous measurements. Little lateral displacements were noted in the top 10 ft of the approach fills. No significant difference between regular backfills and special backfills (CLSM and Geosynthetic-reinforced) was noted. Monitoring of the College avenue bridge in District 2 (South Milwaukee) continues. The search for two or three more bridges is ongoing. The PI is currently discussing the possibility of these new bridges with Mr. R. Kumapayi from WisDOT Headquarters and Mr. S. Maxwell and Mr. J. Liptack (District 2). Several options are being studied: B-28-98, B-67-284, B-28-99, and B-67-262. It seems that these bridges have good foundation soils and shallow backfills (2-4 ft only). It is therefore expected that the approach settlements will be very small. Bridges of weaker foundation soils and deeper approach fill are still being sought in D2 for this research project.

The research team is conducting cost comparison between the following approach settlement alleviation procedures: Hydraulic fill, CLSM, and Geosynthetic-reinforced fill. The research team is also updating the literature review to look at recent advances in this research area.
Work Next Quarter:

Monitoring of the two bridges in District 4 will continue. Monitoring of the College avenue bridge in District 2 (South Milwaukee) will continue. The search for two or three more bridges will also continue. In these bridges the following alleviation procedures will be tested: Hydraulic fill, CLSM, and Geosynthetic-reinforced fill.

Circumstances affecting progress/budget:

Gantt Chart:

Note: Gantt chart shown in State Fiscal Year Quarters